



**DOE/NSF EPSCoR Conference 2004**  
*Experimental Program to Stimulate Competitive Research*  
and  
**Center for Nanoscale Materials Workshop  
for EPSCoR Faculty and Students**

**June 14-16, 2004**

**Argonne National Laboratory  
Argonne, Illinois  
Advanced Photon Source (APS) Conference Center  
Building 402**

***EPSCoR States***

<b><i>Alabama</i></b>	<b><i>Nevada</i></b>
<b><i>Alaska</i></b>	<b><i>New Mexico</i></b>
<b><i>Arkansas</i></b>	<b><i>North Dakota</i></b>
<b><i>Delaware</i></b>	<b><i>Oklahoma</i></b>
<b><i>Hawaii</i></b>	<b><i>Puerto Rico</i></b>
<b><i>Idaho</i></b>	<b><i>Rhode Island</i></b>
<b><i>Kansas</i></b>	<b><i>South Carolina</i></b>
<b><i>Kentucky</i></b>	<b><i>South Dakota</i></b>
<b><i>Louisiana</i></b>	<b><i>Tennessee</i></b>
<b><i>Maine</i></b>	<b><i>U.S. Virgin Islands</i></b>
<b><i>Mississippi</i></b>	<b><i>Vermont</i></b>
<b><i>Montana</i></b>	<b><i>West Virginia</i></b>
<b><i>Nebraska</i></b>	<b><i>Wyoming</i></b>



# Center for Nanoscale Materials Workshop for EPSCoR Faculty and Students

## Monday, June 14

- 8:00                    **Registration** - Atrium of Building 402, APS Conference Center  
**Continental Breakfast** - Building 402 Gallery
- 9:00 - 9:45           **Welcome**  
                         Hermann A. Grunder, Director, Argonne National Laboratory (ANL)
- Introduction to the Center for Nanoscale Materials**  
                         Eric D. Isaacs, Director, Center for Nanoscale Materials, ANL
- Workforce Development and Research Opportunities  
at the Center for Nanoscale Materials**  
                         Harold W. Myron, Director, Division of Educational Programs, ANL
- 9:45 - 10:45        **Session I - Biomaterials**  
**Moderator** - Nada Dimitrijevic, Chemist  
                         Chemistry Division, ANL
- Bio-inspired Materials and Processes**  
                         Tijana Rajh, Chemistry Division, ANL
- Protein-Based Materials for Energy Storage and Transduction**  
                         Millicent A. Firestone, Materials Science Division  
                         and Center for Nanoscale Materials, ANL
- Development of Natural and Synthetic Biomaterials and Their  
Integration into BioMEMS Devices**  
                         Steven A. Soper, Chemistry Department, Louisiana State University
- 10:45 - 11:00       **Break** - Building 402 Gallery
- 11:00 - 12:00       **Session II - Toxicology and Catalysis**  
**Moderator** - Lennox E. Iton, Chemist Experimentalist  
                         Materials Science Division, ANL
- Toxicology of Nanoparticles and Analysis and Modeling of Nanoparticles  
Solution Properties for Physico-Chemical Characterization and Risk  
Assessment**  
                         Robin D. Rogers, Chemistry Department, The University of Alabama
- Design and Catalysis at the Nanoscale**  
                         Christopher L. Marshall, Chemical Engineering Division, ANL
- Design of Catalyst at the Nanoscale**  
                         Ursula M. Graham, Center for Applied Energy Research, University of Kentucky
- 12:00 - 1:30        **Box Lunch** - Building 402 Gallery  
**Invited Speaker**  
                         Efim Gluskin, Director  
                         Experimental Facilities Division/Advanced Photon Source, ANL

- 1:30 - 2:30      **Session III - Hydrogen**  
**Moderator** - James F. Miller, Associate Division Director  
Chemical Engineering Division, ANL  
**Electrochemical Hydrogen Storage and Capture**  
Stephen M. Lipka, Center for Applied Energy Research, University of Kentucky  
**Basic Research for the Hydrogen Economy at Argonne**  
Larry A. Curtiss, Materials Science and Chemistry Divisions, ANL  
**Nanocomposite Membranes and Electrodes for Hydrogen-Powered Fuel Cells**  
Stephen E. Creager, Chemistry Department, Clemson University
- 2:30 - 2:40      **Break** - Building 402 Gallery
- 2:40 - 3:20      **Session IV - Nanomagnetism**  
**Moderator** - J. Samuel Jiang, Physicist  
Materials Science Division, ANL  
**Nanomagnetism Research at Argonne National Laboratory**  
Axel F. Hoffmann, Materials Science Division, ANL  
**Interface and Nanoparticle Magnetism at West Virginia University**  
David Lederman, Physics Department, West Virginia University
- 3:20 - 4:00      **Facilities Access**  
Susan B. Strasser, Advanced Photon Source Operations/Advanced Photon Source, ANL
- 4:00 - 6:00      **Poster Session** - Building 402, Rooms E-1100 and E-1200
1. **Versatile Applications of Anodized Aluminum Oxide Based Nanoporous Membranes**  
Hsien-Hau Wang, Materials Science Division, ANL
  2. **Synthesis of Metallic Nanoparticles in a Microreactor and Their Characterization Using X-ray Absorption Spectroscopy**  
Yujun Song, Center for Advanced Micro Structures and Devices, Louisiana State University
  3. **Self-Assembly and Cross-Linking of Bionanoparticles at Liquid-Liquid Interface**  
Qian Wang, Chemistry and Biochemistry Department, University of South Carolina
  4. **Nanophotonics**  
Gary P. Wiederrecht, Chemistry Division, ANL
  5. **Relating Membrane Micromechanics and Morphology of Cells Adhered on Different Polymeric Surfaces**  
Ping-Fai Sidney Sit, Institute for Micromanufacturing/Biomedical Engineering, Louisiana Tech University
  6. **Applications for Magnetic Nanoparticles in Biosensors, Drug Delivery, and Magnetic Recording**  
Duane T. Johnson, Chemical and Biological Engineering Department, The University of Alabama
  7. **Basic Research Needs for the Hydrogen Economy**  
George W. Crabtree, Materials Science Division, ANL
  8. **Nanocomposite Membranes and Electrodes for Hydrogen-Powered Fuel Cells**  
Branko N. Popov, Chemical Engineering Department, University of South Carolina

**Poster Session (cont'd) - Building 402, Rooms E-1100 and E-1200**

9. **Solid State Storage of Hydrogen in Carbon Nanotubes and Nano-structured Metal Hydride Host Materials**  
Tabbatha A. Dobbins, Physics Department, Louisiana Tech University
10. **Production of Pure Hydrogen and Carbon Nanotubes by Non-oxidative Dehydrogenation of Hydrocarbons Using Nanoparticle Alloy Catalysts**  
Gerald P. Huffman, Consortium for Fossil Fuel Science, University of Kentucky
11. **Nanofabrication at CNM**  
Leonidas E. Ocola, Center for Nanoscale Materials, ANL
12. **Floropolymers for Integrated Photonics**  
Dennis W. Smith, Jr., Chemistry Department, Clemson University
13. **Magnetic Nanoparticles, Fundamentals and Applications**  
Carlos Rinaldi, Chemical Engineering Department, University of Puerto Rico, Mayagüez
14. **In-Situ Synchrotron Studies of Nanostructured Fuel Cell Catalysts**  
Eugene Smotkin, Chemistry Department, University of Puerto Rico
15. **Nanocarbon - Theory and Simulation**  
C. Heath Turner, Chemical Engineering Department, The University of Alabama
16. **Nanostructured Adsorbents and Catalysts for the Desulfurization of Light Hydrocarbon Fuels**  
Mark Crocker, Center for Applied Energy Research, University of Kentucky
17. **Nanocatalysts for Microreactor Research**  
Debasish Kuila, Institute for Micromanufacturing/Chemistry, Louisiana Tech University
18. **CNM Bio-Inorganic Interface Scientific Theme**  
David M. Tiede, Chemistry Division, ANL
19. **Synthesis and Characterization of Boron Nitride Nanotubes**  
Gerardo Morell, Physical Sciences Department, University of Puerto Rico
20. **Virtual Fab Lab**  
Stephen K. Gray, Chemistry Division, ANL
21. **Nanostructured Catalysts for the Hydrogen Economy**  
Alan M. Lane, Chemical Engineering Department, The University of Alabama
22. **Modeling Novel Bio-Catalysts for Fuel Cell Devices**  
Daniela S. Mainardi, Institute for Micromanufacturing/Chemical Engineering, Louisiana Tech University
23. **Designing a Nanoporous Silicate for Catalytic and Nanocomposite Applications**  
Kathleen A. Carrado, Chemistry Division, ANL
24. **Intense Pulsed Neutron Source - User Facility**  
James W. Richardson, Jr., Intense Pulsed Neutron Source, ANL
25. **Catalytic Nanoparticles by Sequential Deposition**  
Carlos R. Cabrera, Chemistry Department, University of Puerto Rico
26. **Catalytic Nanocomposite Membranes**  
Riza Kizilel, Chemistry Division, ANL
27. **Carbon Nanotubes: From Synthesis Towards Device Applications**  
Bingqing Wei, Center for Computation and Technology, Louisiana State University

6:00

**Reception and Buffet Dinner - Argonne Guest House, Building 460**

**Poster Session Resumes - Building 402, Rooms E-1100 and E-1200**

**DOE/NSF EPSCoR Conference 2004**  
***Experimental Program to Stimulate Competitive Research***

**Tuesday, June 15**

- 7:30                    **Registration** - Atrium of Building 402, APS Conference Center  
**Continental Breakfast** - Building 402 Gallery
- 8:30 - 9:00           **Welcome to the DOE/NSF-EPSCoR Conference 2004**  
                         Hermann A. Grunder, Director  
                         Argonne National Laboratory (ANL)  
                         Matesh N. Varma, Program Director  
                         DOE EPSCoR  
                         Office of Science  
                         U.S. Department of Energy  
                         B. Jane Harrington, Program Director  
                         NSF EPSCoR  
                         EPSCoR Office  
                         National Science Foundation
- 9:00 - 10:30         **Moderator** - Harold W. Myron, Director  
                         Division of Educational Programs, ANL  
**Workforce Development for National Laboratories and Universities**  
**Strategic Collaborations Based Upon Regional Collaborations**  
                         Gary J. Mankey, Physics and Astronomy Department  
                         The University of Alabama  
                         Zeno D. Greenwood, Physics Department  
                         Louisiana Tech University  
                         Vakhtang Putkaradze, Mathematics and Statistics Department  
                         University of New Mexico  
                         Robert J. Andres, Space Studies Department  
                         University of North Dakota  
                         Alan M. Lane, Chemical Engineering Department  
                         The University of Alabama  
                         Barbara A. Kucera, Center for Computational Sciences  
                         University of Kentucky
- 10:30 - 11:00        **Break** - Building 402 Gallery
- 11:00 - 12:00        **Perspectives on Developing a National Workforce**  
                         Peter P. Faletra, Director  
                         Workforce Development for Teachers and Scientists  
                         Office of Science  
                         U.S. Department of Energy  
                         Donald E. Thompson, Deputy Assistant Director  
                         Directorate for Education and Human Resources  
                         National Science Foundation
- 12:00 - 1:30         **Networking Buffet Lunch - EPSCoR State Summaries**  
                         Building 402 Gallery

1:30 - 3:30

**Moderator** - Linda Phaire-Washington, Senior Program Leader  
Division of Educational Programs, ANL

**In-depth Overview of Successful Established Partnerships**

***Magnetic Nanostructures and Spintronic Device Development***

Gary J. Mankey, Physics and Astronomy Department  
The University of Alabama  
Laboratory Partnership - Oak Ridge National Laboratory

***Structural Studies of Functional Ferroelectric Polymer Films by Nanoscale Material Engineering***

Shireen Adenwalla, Physics Department  
University of Nebraska-Lincoln  
Laboratory Partnership - Argonne National Laboratory

***Fundamental Mechanisms of Interface Roughness in Amorphous Multilayers***

Randall L. Headrick, Physics Department  
University of Vermont  
Laboratory Partnership - Brookhaven National Laboratory

***Research Collaborations Using Nanotechnology to Study Heavy Metals in Whole Animals***

Barbara A. Wilson, Biology Department  
Jackson State University  
Laboratory Partnership - Argonne National Laboratory

***Synthesis and the Structural Characterization of Perovskites and Perovskite Related Oxides***

Hans-Conrad zur Loye, Chemistry and Biochemistry Department  
University of South Carolina  
Laboratory Partnership - Brookhaven National Laboratory

***Fundamental Problems of Neutron Physics at the Spallation Neutron Source***

Vladimir Gudkov, Physics and Astronomy Department  
University of South Carolina  
Laboratory Partnership - Oak Ridge National Laboratory

***Methodologies and Algorithms for the Real-Time On-Line Modeling and Intelligent Control of Large-Scale Nonlinear Systems***

Asad Davari, Electrical and Computer Engineering Department  
West Virginia University Institute of Technology  
Laboratory Partnership - National Energy Technology Laboratory

***Large Grain Polysilicon Thin Films at Low Temperatures***

Hameed A. Naseem, Electrical Engineering Department  
University of Arkansas  
Laboratory Partnerships - Lawrence Berkeley National Laboratory/National Center for Electron Microscopy; National Renewable Energy Laboratory; Oak Ridge National Laboratory

3:30 - 5:30

**EPSCoR Poster Session and DOE Laboratory Poster Session**

Building 402, Rooms E-1100 and E-1200

**Break** - Building 402 Gallery

6:00 - 8:00

**Reception and Dinner** - Argonne Guest House, Building 460

**Invited Speaker**

Nestor J. Zaluzec, Metallurgist  
Materials Science Division, ANL

## Wednesday, June 16

- 7:30                      **Continental Breakfast** - Building 402 Gallery
- 8:30 - 9:00            **Latest News from DC Regarding EPSCoR**  
                             Matesh N. Varma, Program Director  
                             DOE EPSCoR  
                             Office of Science  
                             U.S. Department of Energy  
  
                             B. Jane Harrington, Program Director  
                             NSF EPSCoR  
                             EPSCoR Office  
                             National Science Foundation
- 9:00 - 11:00           **Moderator** - Frank M. Vivio, Assistant Director  
   Division of Educational Programs, ANL
- What's Hot at the User Facilities**  
                                 ***Advanced Photon Source***  
   Gabrielle G. Long, Experimental Facilities Division/  
   Advanced Photon Source, ANL  
                                 ***Argonne Tandem Linear Accelerator System***  
   Robert V. F. Janssens, Physics Division, ANL  
                                 ***Center for Nanoscale Materials***  
   Stephen K. Streiffer, Materials Science Division, ANL  
                                 ***Electron Microscopy Center***  
   Dean J. Miller, Materials Science Division, ANL  
                                 ***Fermi National Accelerator Laboratory***  
   TBD  
                                 ***Intense Pulsed Neutron Source***  
   James W. Richardson, Jr., Intense Pulsed Neutron Source, ANL  
                                 ***National Synchrotron Light Source***  
   Kenneth Evans-Lutterodt, National Synchrotron Light Source,  
   Brookhaven National Laboratory
- 11:00 - 11:30        **Moderator** - Norman D. Peterson, Assistant to the Director  
   Office of the Director, ANL
- Plenary Panel**  
                                 ***Lessons Learned***  
                                 ***Next Steps***  
                                 ***Future Vision***  
  
                                 Matesh N. Varma, Program Director  
                                 DOE EPSCoR  
  
                                 B. Jane Harrington, Program Director  
                                 NSF EPSCoR  
  
                                 John G. Hehr, Project Director  
                                 NSF EPSCoR  
                                 Fulbright College Dean's Office  
                                 University of Arkansas  
  
                                 Manuel Gomez, Project Director  
                                 NSF EPSCoR  
                                 Resource Center for Science and Engineering  
                                 University of Puerto Rico
- 11:30 - 12:00        **Closing**

